QUICK START

This section is intended to help you make the physical connections and software manipulations necessary to get up and running with your sleek new RPM 26z. If you don't read the entire Hardware Manual, at least read this section. It is also recommended that you read the Quick Start section of the Drag Net Software Manual. If the Drag Net software is not yet installed on your computer, please install it now.

To be safe, leave the audio connections until last. Begin by connecting the IEC power cord. Observe that the **POWER** LED on the front panel illuminates. After a few seconds, the **STATUS** LED should turn from red to yellow to green, and the **PRESET** display should have a number in it (00, if it's the first time you've powered the device). If the **POWER** comes on, but the **STATUS** LED does not turn green, contact the factory.

Connect one end of the Ethernet crossover cable (supplied with the unit) to the **10Base-T** jack on the rear panel. Connect the other end of the cable to an Ethernet port on your computer. The **LINK** LED on the rear panel should be lit. If it is not, verify that you are indeed using a crossover cable, not a standard Ethernet cable. A standard Ethernet cable should only be used if you are connecting the RPM 26z and a computer indirectly using an Ethernet switch. Launch the **Drag Net** application and follow the steps to create a new project and new RPM 26z device configuration. Click the **Configure Hardware IP** shortcut and follow the instructions to set the unit's IP address to be compatible with your computer's Network settings. *Tip: If you aren't sure what IP to use, try the address 192.168.69.69 and subnet 255.255.255.0. This finds the default factory address without manually setting it.*

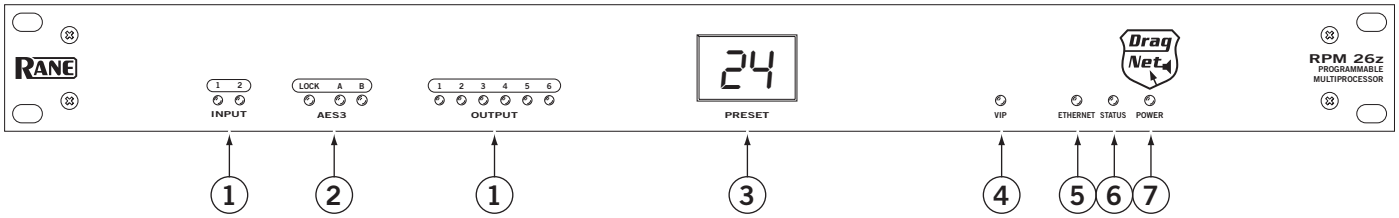
Now click on the **Poll** button in the toolbar. A device name and IP address should appear under the **Live** folder in the **Project** window. If a device does not appear, consult Drag Net's online **Help** for instructions on configuring and verifying your computer's Network settings.

The audio path within the RPM 26z is displayed in Drag Net's **Device Configuration** window as a collection of blocks wired together to form a **Processing Map**. These maps are created offline as **Storage** configurations, which are then transferred to a **Live** unit. Drag blocks from the **Palette** onto the **Processing Map** and wire them together to create the audio path. Save this file frequently using the **File > Save command**. Transfer the selected **Storage** configuration to a **Live** unit using the **Transfer Config** button in the **Project** window. A new, minty green **Device Configuration** window opens once the transfer is complete, indicating you are now online with a **Live** device. Double-click a processing block to display and adjust its **Properties** (parameters) in real time on a **Live** device — there is no need to go offline to make parameter changes.

Once you have a useful configuration in the unit, connect balanced audio **INPUTS** and **OUTPUTS** to the Euroblocks on the rear panel, then turn on the amplifier. As a precautionary measure, all outputs are muted during *and* after a configuration transfer. Unmute each output individually, or use the handy **Mute Outputs** button in the toolbar. Once all outputs are unmuted, audio passes through the unit along the connections *you* defined.

WEAR PARTS: This product contains no wear parts.

Front Panel Description



① **Signal/Overload LED meters** indicate the presence of significant audio signal or overload for Inputs and Outputs. These 3-color meters indicate the available headroom once the analog signal has been converted to digital: -4 dBFS (red, near clipping), -12 dBFS (yellow, high normal level), and -48 dBFS (green, low level). The analog signal level depends on the input and output settings and is displayed in Drag Net's Meter window.

② **AES3 LOCK LED** lights solidly when a valid AES3 digital signal is detected on the AES3 input jack. There does not need to be an audio signal present at the input, only the "carrier" signal.

③ **PRESET LED** displays the number of the most recently recalled Preset, numbered 0 through 24.

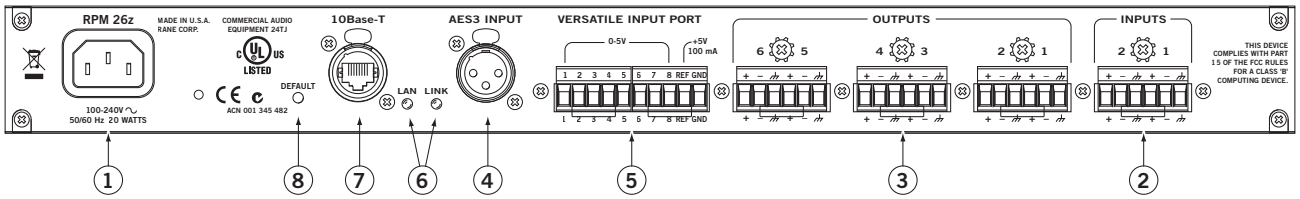
④ **VIP LED** flashes when a change is detected on the Versatile Input Port (VIP). This port is used for direct electrical connections to potentiometers, switches or other logic ports. See Control Connections on page Manual-4 for details.

⑤ **ETHERNET LED** flashes when an Ethernet data packet for this device is received.

⑥ **STATUS LED** reflects the overall status of the unit:
Red - initializing (briefly) or possible internal error.
Yellow - working, but not currently processing audio.
Green - processing audio.

⑦ **POWER LED** lights solidly when the unit is powered on.

Rear Panel Description



① **POWER IEC jack** connects to AC line voltage, 100-240 VAC ±10%. Use the 3-prong IEC power cable (included).

② **Balanced analog audio INPUTS 1 and 2** on Euroblock connectors.

③ **Balanced analog audio OUTPUTS 1 through 6** on Euroblock connectors. Same wiring notes as the Inputs.

④ **AES3 digital audio INPUT** is an XLR female connector. See Digital AES3 Input on page Manual-3.

⑤ **VERSATILE INPUT PORT** provides 8 logic or voltage inputs for remote level control and Preset recall on a Euroblock connector. See Control Connections on page Manual-4.

⑥ **LAN and LINK** reflect the state of the Ethernet connection. LINK lights solidly when a valid connection to another Ethernet device (e.g., a PC) is detected. LAN flashes when communicating with another Ethernet device.

⑦ **10Base-T jack** accepts a standard Ethernet cable with a RJ-45 connector. See Control Connections on page Manual-4.

⑧ **DEFAULT button** recalls Preset 1 when pressed. Holding this button while applying power puts the unit into a codeload mode for updating firmware.

Audio Connections

For each Input or Output Euroblock connector:

- Connect the (positive) audio line to the '+' terminal.
- Connect the (negative) audio line to the '–' terminal.
- Connect the cable shield to the ground terminal.

For those installations where the RPM 26z's internal shield-to-chassis connection causes interference, connect each shield directly to the chassis PEM nut located above each Euroblock connector, keeping the shield wrapped around the audio conductors as much as possible.

For optimum Electromagnetic Interference (EMI) immunity, connect the shields at both ends of the cable. See the RaneNote "Sound System Interconnection" for more information on system connections and proper grounding practices.

Analog Input Stage

Each analog input uses a two-stage gain approach. The first stage contains a variable gain preamp. The second stage contains a Digital Trim control located immediately after the A/D converter.

Input Clipping

If you've set the Analog Gain so the input stage is not clipping, it is not possible to clip the A/D converter, since there is no additional gain between the initial input stage and the A/D converter. The Digital Trim control, located after the A/D converter, can be set to clip the signal to your heart's content, so adjusting this trim to provide the hottest signal to the DSPs *without* clipping is the most important step when setting up gain structure. For this reason, a dedicated meter displaying the signal level being passed to the DSPs is provided in each Analog Input block.

If the DSPs are working with a clipped signal, the audio is (as expected) distorted and none too pretty, but it is not a drastic, damaging sound. And while it's technically possible to write a DSP algorithm to emulate the glorious clipping distortion of vacuum tubes, it's not particularly useful for an installed sound system, where the DSP power could be put to better use removing that annoying 500 Hz feedback from the podium mic. Plus, they don't yet make DSP chips with gold-plated substrates for those celestial highs and that moist, supple midrange.

Analog Output Stage

Each analog output also uses a two-stage gain approach, which differs slightly from that of the analog input stage. The first stage is a Digital Trim control located immediately *before* the D/A converter. The second stage is an analog trim control located immediately *after* the D/A converter. Attenuation is handled in the analog domain, while boosting (when the incoming digital signal is low) is handled in the digital domain. Boosting and attenuating using this two-stage approach helps maintain the RPM 26z's excellent noise performance.

Digital (AES3) Input

AES3 is a popular 2-channel (stereo) digital audio interface commonly found on professional digital audio equipment (digital mixers, DAT machines, etc.). Each channel of the AES3 digital stream is treated independently within the RPM 26z.

See the RaneNote "Interfacing AES3 and S/PDIF", available from Rane's web site (www.rane.com/library.html), for more information about interfacing consumer S/PDIF gear to the professional AES3 standard.

Use the AES3 Input to:

- Connect from the AES3 Ouput of an RPM 88/44/22.
- Connect directly from the AES3 output of a digital mixer.
- Connect to an external A/D converter, effectively adding two more analog inputs.

Incoming Sample Rate and Word Length

The AES3 input has a built-in sample rate converter capable of accepting incoming sample rates up to 96 kHz. Sample rates exceeding the RPM 26z's internal 48 kHz sample rate are automatically downsampled. Word lengths up to 24-bits are accepted.

Control Connections

Versatile Input Port (VIP)

Eight logic input pins are provided, each capable of accepting DC voltage between 0-5 VDC. VIP pins are used with contact closure switches for Preset recall, or with potentiometers for remote Level control. The functionality (Preset recall versus control) of each pin is assignable as part of the Device Configuration.

- The maximum allowable voltage on any VIP pin is 5.3 VDC.
- Use of twisted pair cable is recommended for better noise immunity.
- If an external device is used to generate a 0 to 5 volt signal, connect the ground of the external device to the GND pin of the VIP.

Preset Recall Using Contact Closure Switches

The minimum "low" voltage required to detect a contact closure and change Presets is 2.5 V. Since the internal pull up is 100 kΩ to +5 V, it is possible to calculate the maximum allowable cable length, provided the wire resistance per foot (or meter) is known.

Example:

To be safe, let's allow a maximum of 80 kΩ worth of cable resistance. This value keeps the voltage divider formed by the 100 kΩ internal resistance and 80 kΩ cable resistance from dropping below 2.5 V.

(5 V * 100 kΩ) / (100 kΩ + 80 kΩ) = 2.777 V

If the cable resistance is 30 Ω per 1,000 feet (305 meters)

(1,000 ft / 30 Ω) * 80,000 Ω = 2,666,666 ft (813 km)

Thus, you can only use 2,666,666 feet (505 miles) of twisted pair cable before the Preset recall functionality becomes intermittent (assuming the cable is properly twisted and not run through excessive magnetic or electric fields).

Remote Level Control Using Potentiometers

The VIP inherently prefers linear taper 10 kΩ potentiometers, which provide a nice audio taper "feel" for the end user. When used with suitable twisted pair wiring, the 10 kΩ value also offers acceptable noise immunity and very long cable lengths.

AMX and Crestron Control

There are two ways to control a Drag Net device from an AMX or Crestron system. Use either Ethernet connectivity or use the rear panel Versatile Input Port (VIP). Each of the 8 VIP pins supports either switch closure Preset recall or zero-to-five volt control of Level.

Many AMX/Crestron applications require simple Level control and/or Preset recall. This is most easily accomplished using the VIP (Versatile Input Port) found on all Drag Net devices.

VIP Preset Recall

Connect a switch closure or relay to a VIP pin and short it to the ground (GND) pin to recall the corresponding Preset. For example, shorting VIP pin 1 to the GND terminal recalls Preset 1; pin 2 recalls Preset 2, etc. There are more details about this functionality in the Drag Net Help file and on our Drag Net web page. Be certain to appropriately set the VIP Allocation in Drag Net's Parameter Window.

If GND contention of two or more pins simultaneously occurs, the highest-numbered VIP pin takes precedence. For example, if pin 3 is shorted to GND and pin 6 is then shorted to GND, Preset 6 is recalled. If pin 3 is closed and then pin 2, nothing happens -- Preset 2 is ***not*** recalled. This permits a hierarchy of Presets when using VIP pin closures for tiered priority paging. Since there are only eight VIP pins, you can only recall up to eight Presets using switch closures.

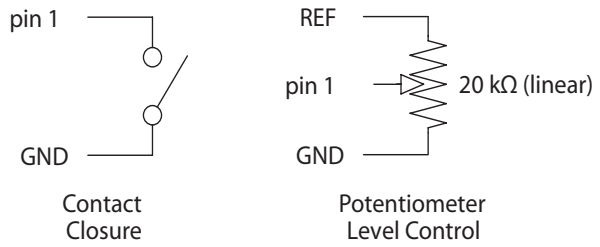
There are two ways to recall more than eight presets.

1. Use the Drag Net software Recall button which is only intended for the system installer/designer.
2. Use an Ethernet command from an AMX or Crestron Ethernet-equipped product.

[When using Drag Net's Auto Mixer/Ducker block, you have the ability to link a VIP pin closure to a push-to-talk switch in a paging or boardroom application. When using the Ducker block in these applications, the VIP pins act independently provided you Group the appropriate VIP pin with the Auto Mixer/Ducker's Input in Drag Net's Remote Map. Again, see our Drag Net Applications for examples.]

VIP CONNECTION

(examples for VIP pin 1)



VIP Level control

Connect a zero to five volt DC voltage to a VIP pin from an AMX or Crestron card to adjust any or all Level blocks placed in the Processing Map. Use Groups in Drag Net's Remote Map to link one or more Level blocks so they track each other when using a VIP pin. Be certain to appropriately set the VIP Allocation in Drag Net's Parameter Window. When using VIP pins with Level blocks, set the minimum and maximum for each Level block by double-clicking it while it's in a Remote Map Group. This keeps the max and min burdens within the Drag Net device — but only when using the VIP pin to control Levels, not when adjusting Levels from Ethernet commands.

You can use up to eight voltage control inputs linked to Level(s) using the rear panel VIP pins. Combinations of Preset switches & voltage Level "pots" are possible as long as combined, they do not exceed the eight pins provided.

Since you can Group any or all Level blocks in Drag Net's Remote Map, it's much easier to implement a stereo level control since the Drag Net device is burdened with the task of tracking many Levels. You can use this to your advantage when using VIP pins to adjust multiple zones or levels. Since you can place the Level block anywhere within the Drag Net Processing Map, you can Group Level blocks at the input, at the output or anywhere in-between — just place the Level block where you want it.

Ethernet control

To download the AMX or Crestron control code and documentation, visit *www.rane.com/dragnet*

Ethernet Port

The Ethernet port is used to configure, monitor, and control the RPM 26z via standard 10Base-T Ethernet communication. Use an Ethernet crossover cable (one is included with each unit) to connect the RPM 26z directly to a computer. Use a standard (non-crossover) Ethernet cable if the RPM 26z and computer are connected indirectly using an Ethernet repeater hub or switch.

All devices connected to the Ethernet port, including repeater hubs, switches, and the computer's Network Interface Card (NIC) must support 10Base-T communication.